

# KEY MESSAGES – ZIKA VIRUS DISEASE

Updated January 27, 2016

Updated information is in *blue*

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## GENERAL

### What is Zika?

Zika virus is spread to people primarily through the bite of an infected *Aedes* species mosquito. The most common symptoms of Zika virus disease (or Zika) are fever, rash, joint pain, and conjunctivitis (red eyes). The illness is usually mild with symptoms lasting for several days to a week. There is no vaccine to prevent or medicine to treat Zika. Severe disease requiring hospitalization is uncommon and deaths are rare.

Mosquitoes that spread Zika virus are aggressive daytime biters, prefer to bite people, and live indoors and outdoors near people. The mosquitoes that spread Zika virus also spread dengue and chikungunya viruses.

*Zika virus is not currently found in the continental United States, but cases have been reported in returning travelers.* Outbreaks of Zika have been reported in tropical Africa, Southeast Asia, the Pacific Islands, and most recently in the Americas. Because the mosquitoes that spread Zika virus are found throughout the world, it is likely that outbreaks will continue to spread.

### Is this a new virus?

No. Outbreaks of Zika virus disease (or Zika) previously have been reported in tropical Africa, Southeast Asia, and the Pacific Islands. Zika virus likely will continue to spread to new areas. In May 2015, the Pan American Health

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Organization (PAHO) issued an alert regarding the first confirmed Zika virus infection in Brazil. [From May 2015 through January 22, 2016, local transmission has been reported in several other countries and territories.](#)

[In December 2015, the Commonwealth of Puerto Rico, a United States territory, reported its first confirmed Zika virus case. Locally transmitted Zika virus has not been reported in the continental United States, but cases of Zika have been reported in returning travelers.](#) With the recent outbreaks in the Americas, the number of Zika cases among travelers visiting or returning to the United States will likely increase. These imported cases may result in local spread of the virus in some areas of the United States.

### **[Does CDC know how many Zika cases were confirmed worldwide before the 2007 outbreak on Yap Islands in the Federated States of Micronesia?](#)**

[Before 2007, at least 14 cases of human Zika virus disease had been documented in the literature, although other cases were likely to have occurred and were not published. It is likely that Zika virus has occurred in many locations over time; however, the symptoms of Zika virus are similar to those of many other diseases. Because of limited availability for diagnostic testing and the challenges of cross-reactivity with other flaviviruses, like dengue virus, it is very likely that many other cases were not identified, not tested, or not published. Both the \*New England Journal of Medicine\* and \*Emerging Infectious Diseases\* published papers in 2009 that contain some historical information on Zika virus cases.](#)

### **What is Guillain-Barré syndrome (GBS)?**

Guillain-Barré syndrome (GBS) is a rare disorder where a person's own immune system damages the nerve cells, causing muscle weakness and sometimes, paralysis. These symptoms can last a few weeks or several months. While most people fully recover from GBS, some people have permanent damage and in rare cases, people have died.

### **Does Zika virus infection cause Guillain-Barré syndrome (GBS)?**

[We do not know. It is difficult to determine if any particular pathogen "caused" Guillain-Barré syndrome \(GBS\). The Brazil Ministry of Health is reporting an increase number of people affected with GBS. CDC is working to determine if Zika and GBS are related.](#)

### **What should I do if I have Zika?**

Treat the symptoms:

- Get plenty of rest.
- Drink fluids to prevent dehydration.
- Take medicines such as acetaminophen or paracetamol to reduce fever and pain.
- Do not take aspirin or other non-steroidal anti-inflammatory drugs.
- [If you are taking medicine for another medical condition, talk to your healthcare provider before taking additional medication.](#)

[Protect others:](#) During the first week of infection, Zika virus can be found in the blood and passed from an infected person to another mosquito through mosquito bites. An infected mosquito can then spread the virus to other people. To help prevent others from getting sick, avoid mosquito bites during the first week of illness by adhering with mosquito bit prevention steps.

See your healthcare provider if you are pregnant and develop a fever, rash, joint pain, or conjunctivitis (red eyes) within 2 weeks after traveling to a country where Zika virus cases have been reported. Be sure to tell your healthcare provider where you traveled.

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## SYMPTOMS

### **What are the symptoms of Zika virus disease (Zika)?**

The most common symptoms of Zika virus disease are

- Fever
- Rash
- Joint pain
- Conjunctivitis (red eyes)

Other symptoms include

- Muscle pain
- Headache

These symptoms are similar to those of dengue and chikungunya, which are diseases caused by other viruses spread by the same type of mosquitoes.

About 1 in 5 people infected with Zika virus become ill. The illness is usually mild with symptoms lasting for several days to a week. Severe disease requiring hospitalization is uncommon and deaths are rare.

## DIAGNOSIS

### **How is Zika virus disease (Zika) diagnosed?**

See your healthcare provider if you develop symptoms (fever, rash, joint pain, red eyes) and you live in or have recently traveled to areas where Zika has been reported.

[Your healthcare provider may order blood tests to look for Zika or other similar viral diseases like dengue or chikungunya.](#)

### **Can someone who returned from a country with Zika virus get tested for the virus?**

See your healthcare provider if you develop symptoms (fever, rash, joint pain, red eyes) and tell him or her that you traveled to a country with Zika virus. Your healthcare provider may order blood tests to look for Zika virus infection or other similar diseases like dengue and chikungunya viruses.

Zika virus diagnosis is based on a combination of travel history, clinical signs and symptoms, and specialized laboratory tests of blood.

## TREATMENT

### **What is the treatment for Zika virus disease (Zika)?**

There is no vaccine or specific medicine to treat Zika virus infections.

[Treat the symptoms](#)

- [Get plenty of rest.](#)
- [Drink fluids to prevent dehydration.](#)
- [Take medicines such as acetaminophen or paracetamol to reduce fever and pain.](#)
- [Do not take aspirin or other non-steroidal anti-inflammatory drugs.](#)
- [If you are taking medicine for another medical condition, talk to your healthcare provider before taking additional medication.](#)

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### **What should I do if I am sick or if a family member is sick with Zika?**

During the first week of infection, Zika virus can be found in the blood. The virus can be passed from an infected person to another mosquito through mosquito bites. An infected mosquito can then spread the virus to other people.

To help prevent others from getting sick, avoid mosquito bites during the first week of illness.

- Wear long-sleeved shirts and long pants.
- Stay in places with air conditioning or that use window and door screens to keep mosquitoes outside.
- Sleep under a mosquito bed net if you are overseas or outside and are not able to protect yourself from mosquito bites.
- Use Environmental Protection Agency (EPA)-registered insect repellents. All EPA-registered insect repellents are evaluated for safety and effectiveness.
  - Always follow the product label instructions.
  - Reapply insect repellent every few hours.
  - Do not spray repellent on the skin under clothing.
  - If you are also using sunscreen, apply sunscreen before applying insect repellent.
- If you have a baby or child:
  - Do not use insect repellent on babies younger than 2 months of age.
  - Dress your child in clothing that covers arms and legs, or
  - Cover crib, stroller, and baby carrier with mosquito netting.
  - Do not apply insect repellent onto a child's hands, eyes, mouth, and cut or irritated skin.
  - Adults: Spray insect repellent onto your hands and then apply to a child's face.
- Treat clothing and gear with permethrin or purchase permethrin-treated items.
  - Treated clothing remains protective after multiple washings. See product information to learn how long the protection will last.
  - If treating items yourself, follow the product instructions carefully.
  - Do **NOT** use permethrin products directly on skin. They are intended to treat clothing.

## **TRANSMISSION**

### **How do people get infected with Zika?**

Zika virus is spread to people primarily through the bite of an infected *Aedes* species mosquito. These mosquitoes also spread dengue and chikungunya viruses. Mosquitoes that spread Zika, chikungunya, and dengue are aggressive daytime biters, prefer to bite people, and live indoors and outdoors near people. Mosquitoes become infected when they bite a person already infected with the virus. Infected mosquitoes can then spread the virus to other people through bites.

[Zika virus can be passed from mother to her baby during pregnancy.](#) This mode of transmission is being investigated.

To date, there are no reports of infants getting Zika through breastfeeding. Because of the benefits of breastfeeding, mothers are encouraged to breastfeed even in areas where Zika virus is found.

There has been one report of possible spread of the virus through blood transfusion and one report of possible transmission through sexual contact.

### **Can someone who traveled from a country with Zika spread the virus?**

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During the first week of infection with Zika virus, Zika virus can be found in the blood and passed from an infected person to another mosquito through mosquito bites. An infected mosquito can then spread the virus to other people. To help prevent others from getting sick, avoid mosquito bites during the first week of illness.

### **Can mothers pass Zika on to babies?**

Zika virus can be passed from mother to her baby during pregnancy. This mode of transmission is being investigated.

To date, there are no reports of infants getting Zika through breastfeeding. Because of the benefits of breastfeeding, mothers are encouraged to breastfeed even in areas where Zika virus is found.

### **Can Zika be spread during breastfeeding?**

To date, there are no reports of infants getting Zika through breastfeeding. Because of the benefits of breastfeeding, mothers are encouraged to breastfeed even in areas where Zika virus is found.

### **Can Zika be sexually transmitted?**

There has been one report of possible spread of the virus through blood transfusion and one report of possible transmission through sexual contact.

### **Is CDC going to release recommendations about the sexual transmission of Zika virus?**

CDC is aware of a few scientific papers that suggests Zika virus may be transmitted through sex. These papers point to a theoretical risk but the science to date is clear that Zika virus is primarily transmitted to people through the bite of an infected mosquito. The agency has no immediate plans to make recommendations regarding sexual transmission of Zika virus, but we continue to review and evaluate the research on potential paths of transmission as it becomes available. CDC's immediate epidemiological studies are being designed to help scientists better understand the risk of Zika virus transmission from a pregnant women to her unborn baby.

### **Who is at risk of being infected?**

Anyone who is living in or traveling to an area where Zika virus is found who has not already been infected with Zika virus is at risk for infection, including pregnant women.

### **Are you immune for life once infected?**

Once a person has been infected, he or she is likely to be protected from future infections.

## **PREVENTION**

### **What can people do to prevent becoming infected with Zika?**

There is no vaccine to prevent Zika virus disease. The best way to prevent diseases spread by mosquitoes is to avoid being bitten. Protect yourself and your family from mosquito bites. Here's how:

- Wear long-sleeved shirts and long pants.
- Stay in places with air conditioning or that use window and door screens to keep mosquitoes outside.
- Use Environmental Protection Agency (EPA)-registered insect repellents. All EPA-registered insect repellents are evaluated for safety and effectiveness.
  - Always follow the product label instructions.
  - Reapply insect repellent every few hours.
  - Do not spray repellent on the skin under clothing.

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- If you are also using sunscreen, apply sunscreen before applying insect repellent.
- If you have a baby or child:
  - Do not use insect repellent on babies younger than 2 months of age.
  - Dress your child in clothing that covers arms and legs, or
  - Cover crib, stroller, and baby carrier with mosquito netting.
  - Do not apply insect repellent onto a child's hands, eyes, mouth, and cut or irritated skin.
  - Adults: Spray insect repellent onto your hands and then apply to a child's face.
- Treat clothing and gear with permethrin or purchase permethrin-treated items.
  - Treated clothing remains protective after multiple washings. See product information to learn how long the protection will last.
  - If treating items yourself, follow the product instructions carefully.
  - Do **NOT** use permethrin products directly on skin. They are intended to treat clothing.
- Sleep under a mosquito bed net if you are overseas or outside and are not able to protect yourself from mosquito bites.

### **What kind of insect repellent should I use?**

Repellents containing DEET, picaridin, IR3535, and some oil of lemon eucalyptus and para-menthane-diol products provide long-lasting protection. Choose one insect repellent and use it regularly. Products with higher percentages of active ingredient will provide longer protection. Always follow the label instructions when using insect repellent. Label instructions will indicate the frequency of application.

### **Can I use natural insect repellents to prevent mosquito bites?**

In the United States, not all natural repellents have been registered with the Environmental Protection Agency (EPA). Choosing an EPA-registered repellent ensures that EPA has evaluated the product for effectiveness. CDC recommends that you use an insect repellent that is EPA-registered because these are the only ones proven to be safe and effective when used as directed.

### **Is there a vaccine to prevent or medication to treat infection?**

- No. No vaccine or medications are available to prevent or treat Zika infections.
- Take medicines such as acetaminophen or paracetamol to reduce fever and pain.
- Do not take aspirin or other non-steroidal anti-inflammatory drugs.
- If you are taking medicine for another medical condition, talk to your healthcare provider before taking additional medication.

### **Is it safe to use an insect repellent if I am pregnant or nursing?**

Yes, using an insect repellent is safe and effective. Pregnant women and women who are breastfeeding can and should choose an Environmental Protection Agency (EPA)-registered insect repellents and use it according to the product label.

## **TRAVEL**

### **If I am traveling to a country with Zika virus, should I be concerned about the transmission of Zika?**

Yes. Travelers who go to countries where Zika cases have been recently confirmed are at risk of being infected with Zika virus. Travelers may also be at risk of being infected with dengue or chikungunya virus. Mosquitoes that spread Zika spread other viruses and are aggressive daytime biters, prefer to bite people, and live indoors and outdoors. There is no vaccine available for Zika virus. The best way to avoid Zika virus infection is to [prevent mosquito bites](#).

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Some travelers become infected while traveling abroad but do not get sick until they return home. Be aware of any illness or symptoms once you return home. Tell your healthcare provider where you have traveled and when you were there.

CDC has issued a [travel notice \(Level 2-Practice Enhanced Precautions\)](#) for people traveling to regions and certain countries where Zika virus transmission is ongoing. [Specific areas where Zika virus transmission is ongoing are often difficult to determine and are likely to change over time.](#) For the latest travel notice information visit: <http://wwwnc.cdc.gov/travel/page/zika-travel-information>.

This alert follows reports in Brazil of [microcephaly](#) and other poor pregnancy outcomes in babies of mothers who were infected with Zika virus while pregnant. However, additional studies are needed to further characterize this relationship. More studies are planned to learn more about the risks of Zika virus infection during pregnancy.

Until more is known, CDC recommends special precautions for pregnant women and women trying to become pregnant:

- Pregnant women in any trimester should consider postponing travel to the areas where Zika virus transmission is ongoing. Pregnant women who must travel to one of these areas should talk to their doctor or other healthcare provider first and strictly follow [steps to avoid mosquito bites](#) during the trip.
- Women trying to become pregnant should talk to their healthcare provider before traveling to these areas and strictly follow [steps to prevent mosquito bites during the trip](#).

#### **What countries have Zika virus?**

Specific areas where Zika virus transmission is ongoing are often difficult to determine and are likely to change over time. Please visit [CDC's Zika Travel Information page](#) for the most updated information.

#### **What countries and territories have travel notices because of Zika?**

For a complete listing of travel health notices, see [CDC's Zika Travel Information webpage](#).

#### **How does CDC determine which countries to include in this travel notice?**

Countries with confirmed locally transmitted cases of Zika are included in the travel notice.

#### **Are there U.S. travel restrictions for people infected with Zika virus?**

There are no restrictions for travelers coming back to the United States who have contracted Zika virus.

#### **Why are other countries where Zika has been reported not included in this notice?**

Countries with ongoing transmission are included in current notices. Countries with past transmission are not included. CDC has had Zika notices in the past for several other countries, but those were removed as outbreaks waned.

#### **How unusual is the type of travel notice that CDC has issued?**

The level 2 alert travel notices are posted for countries that have reported ongoing Zika transmission. Because of the large number of countries in Central and South America and the Caribbean, these are combined into regional notices, as has been done for chikungunya.

#### **Will more countries be added to the travel notice?**

CDC will work with PAHO to monitor the spread of Zika virus and as transmission is confirmed in new areas, we will modify travel guidance accordingly.

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## **What can travelers do to prevent Zika?**

Currently, there is no vaccine to prevent or medicine to treat Zika. Travelers can protect themselves by [preventing mosquito bites](#).

## **I was in Brazil recently—how long do I need to wait after returning to get pregnant?**

- If a woman is concerned that she may be infected with Zika virus and is trying to get pregnant, she should talk to her healthcare provider before trying to conceive.
- Anyone who is living in or traveling to an area where Zika virus is found who has not already been infected with Zika virus is at risk for infection, including pregnant women.
- About one in five people infected with Zika will get sick. For people who get sick, the illness is usually mild. For this reason, many people might not realize they have been infected.
- [If infected, Zika virus will remain in the blood for about a week.](#)
- [The most common symptoms of Zika virus disease are fever, rash, muscle or joint pain, and conjunctivitis \(red eyes\). Symptoms typically begin 2 to 7 days after being bitten by an infected mosquito. However, symptoms may occur up to two weeks after being bitten by an infected mosquito.](#)

## **I am pregnant and got sick while I was in Brazil recently. How do I know if I might have had Zika virus?**

[If you are pregnant woman and are concerned that you might have been infected by Zika virus because of recent travel to countries where the infection has been reported, you should share those concerns with your healthcare provider.](#) It will be important for your healthcare provider to know the details about your possible exposure to Zika virus and any symptoms of the virus that you experienced. The most common symptoms of Zika virus disease are a fever, rash, joint pain, and conjunctivitis (red eyes).

Information for healthcare providers, can be found on the Zika virus [Information for Health Care Providers](#) website.

## **What guidance you providing for airlines?**

Airlines routinely receive notification of travel notices through the Travelers' Health Branch partner pushlist. Quarantine Branch also sends the notices to domestic airlines via A4A (Airlines 4 America) and IATA (International Air Transport Association). Today, Quarantine Branch will send a follow-up email after the travel notices publish with the following points highlighted:

- The risk of mosquito-borne transmission on aircraft is extremely low
- Air crew traveling to countries where Zika is spreading should follow the recommendations in the travel notice

Disinsection is not routinely done on incoming flights to the United States. Although disinsection, when done appropriately, was declared safe by WHO in 1995, there is still much debate about the safety of the agents and methods used. The United States reserves the right to require disinfection in case of increased threat of vector or disease spread.

## **[Is it possible that airport screening could be established to monitor travelers coming into the United States from Zika-affected countries?](#)**

[CDC is not conducting enhanced entry screening of arriving travelers for Zika. CDC and Customs and Border Protection are working together to assess the situation and determine necessary measures.](#)

## **[Are there any special recommendations in advance of the Olympics this summer?](#)**



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The Zika epidemic in Brazil and the rest of the Americas is fast moving and rapidly evolving. CDC will post more specific guidance for the 2016 Summer Olympics as the timeframe gets closer. It would be unwise to prematurely speculate what the status or content will be 6 months from now.

## IN THE UNITED STATES

### Should we be concerned about Zika in the United States?

The U.S. mainland does have *Aedes* species mosquitoes that can become infected with and spread Zika virus. U.S. travelers who visit a country where Zika is found could become infected if bitten by a mosquito. [With the recent outbreaks, the number of Zika virus disease cases among travelers visiting or returning to the United States will likely increase.](#) These imported cases may result in local spread of the virus in some areas of the United States. CDC has been monitoring these epidemics and is prepared to address cases imported into the United States and cases transmitted locally.

- **U.S. imported case:** A person with Zika virus disease who became infected outside the United States and then visited or returned to the United States.
- **Local transmission:** Local transmission means that mosquitoes in the area have been infected with Zika virus and can transmit it to humans.

### How widespread would an outbreak of Zika virus be in the U.S.?

For Zika to cause an outbreak in the United States

- People infected with the virus need to enter the U.S.
- An *Aedes* mosquito must bite the infected person during the relatively short time that the virus can be found in the person's blood.
- The infected mosquito must live long enough for the virus to multiply and for the mosquito to bite another person.

CDC is not able to predict how much Zika virus would spread in the United States. Many areas in the United States have mosquitoes that can become infected with and transmit Zika virus. However, recent chikungunya and dengue outbreaks in the United States suggest that Zika outbreaks in the U.S. mainland may be relatively small and focal. Given this, it is important that we maintain and improve our ability to identify and test for Zika and other mosquito-borne diseases. We would not be surprised to see additional imported cases here in the U.S. from travelers who return from areas where Zika virus is circulating. It is also possible, as a result of imported cases, that we may see some limited local transmission of Zika virus in some parts of the U.S., similar to what occurred in regards to chikungunya and dengue viruses.

### How many travel-associated cases have been diagnosed in the U.S.?

CDC continues to work with states to monitor the United States for mosquito-borne diseases, including Zika. [In 2016, Zika became a nationally notifiable condition. Healthcare providers are encouraged to report suspected cases to their state or local health departments to facilitate diagnosis and mitigate the risk of local transmission.](#) To date, local transmission of Zika virus has **not** been identified in the continental United States. Limited local transmission may occur in the mainland United States but it's unlikely that we will see widespread transmission of Zika in the mainland U.S.

### How many state health departments have informed CDC of confirmed cases of Zika?

[Zika virus disease is now a nationally notifiable condition in the United States. This means that healthcare providers are required to report suspected cases to their state or local health departments to facilitate diagnosis](#)

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and mitigate the risk of local transmission. State health departments are encouraged to report laboratory-confirmed cases to CDC through ArboNET, the national surveillance system for arboviral disease.

Currently, only a few state health departments have the capacity to test for Zika virus. CDC is working with public health partners to increase the number of states with capacity to test for Zika virus. Because several state health departments have testing capacity, CDC will not always know about the number of cases being tested at the state level.

CDC and the Council of State and Territorial Epidemiologists worked together to make Zika virus infection nationally notifiable. This means that any case of Zika virus infection would have to be reported through Arbonet, a national electronic surveillance system for arboviral diseases, by the state health departments to CDC.

CDC is concerned about both imported and locally acquired cases of Zika virus infection in the United States. However, given the number of countries reporting Zika virus outbreaks, we expect that the number of imported Zika cases will increase. Locally acquired cases are of greater concern to CDC because this means that local mosquitoes are infected and could further spread the virus to people.

### **Is Zika a nationally notifiable disease?**

Because of the seriousness of Zika virus disease to pregnant women and in response to the largest reported Zika outbreak, CDC and the Council of State and Territorial Epidemiologists have worked together to confirm that Zika virus disease is now a notifiable condition in the United States.

## **WHAT CDC IS DOING**

### **What is CDC doing about Zika?**

CDC has been aware of Zika for some time and has been preparing for its possible introduction into the United States. Laboratories in many countries have been trained to test for chikungunya and dengue. These skills have prepared these laboratories for Zika testing.

CDC is working with international public health partners and with state health departments to

- Alert healthcare providers and the public about Zika.
- Provide state health laboratories with diagnostic tests.
- Detect and report cases, which will help prevent further spread.

The arrival of Zika in the Americas demonstrates the risks posed by this and other exotic viruses. CDC's health security plans are designed to effectively monitor for disease, equip diagnostic laboratories, and support mosquito control programs both in the U.S. and around the world.

## **ZIKA AND PREGNANCY**

### **Does Zika virus infection in pregnant women cause birth defects, such as microcephaly?**

CDC has issued a [travel notice \(Level 2-Practice Enhanced Precautions\)](#) for people traveling to regions and certain countries where Zika virus transmission is ongoing.

This notice follows reports in Brazil of [microcephaly](#) and other poor pregnancy outcomes in babies of mothers who were infected with Zika virus while pregnant. However, additional studies are needed to further characterize this relationship. More studies are planned to learn more about the risks of Zika virus infection during pregnancy.

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Until more is known, CDC recommends special precautions as follows

- Pregnant women in any trimester should consider postponing travel to the areas where Zika virus transmission is ongoing. Pregnant women who do travel to one of these areas should talk to their doctor or other healthcare provider first and strictly follow [steps to avoid mosquito bites](#) during the trip.
- Women trying to become pregnant should consult with their healthcare provider before traveling to these areas and strictly follow [steps to prevent mosquito bites during the trip](#).

Because specific areas where Zika virus transmission is ongoing are difficult to determine and likely to change over time, CDC will update this travel notice as information becomes available. Check [CDC's Zika Travel Information page](#) frequently for the most up-to-date recommendations.

### **Should pregnant women travel to areas where Zika has been confirmed?**

CDC has issued a [travel notice \(Level 2-Practice Enhanced Precautions\)](#) for people traveling to regions and certain countries where Zika virus transmission is ongoing.

This notice follows reports in Brazil of [microcephaly](#) and other poor pregnancy outcomes in babies of mothers who were infected with Zika virus while pregnant. However, additional studies are needed to further characterize this relationship. More studies are planned to learn more about the risks of Zika virus infection during pregnancy.

Until more is known, CDC recommends special precautions as follows:

- Pregnant women in any trimester should consider postponing travel to the areas where Zika virus transmission is ongoing. Pregnant women who do travel to one of these areas should talk to their doctor or other healthcare provider first and strictly follow [steps to avoid mosquito bites](#) during the trip.
- Women trying to become pregnant should consult with their healthcare provider before traveling to these areas and strictly follow [steps to prevent mosquito bites during the trip](#).

Because specific areas where Zika virus transmission is ongoing are difficult to determine and likely to change over time, CDC will update this travel notice as information becomes available. Check [CDC's Zika Travel Information website](#) frequently for the most up-to-date recommendations.

Currently, there is no vaccine to prevent or medicine to treat Zika. Only one in five people infected with Zika infection may develop symptoms. Illness from Zika is usually mild and does not require hospitalization. Travelers are strongly urged to protect themselves by [preventing mosquito bites](#):

- Wear long-sleeved shirts and long pants
- Use EPA-registered insect repellents containing DEET, picaridin, oil of lemon eucalyptus (OLE), or IR3535. Always use as directed.
  - Insect repellents containing DEET, picaridin, and IR3535 are safe for pregnant and nursing women and children older than 2 months when used according to the product label. Oil of lemon eucalyptus products should not be used on children under 3 years of age.
- Use [permethrin-treated](#) clothing and gear (such as boots, pants, socks, and tents).
- Stay and sleep in screened-in or air-conditioned rooms.

### **Should a pregnant woman who traveled to an area with Zika virus be tested for the virus?**

See your healthcare provider if you are pregnant and develop a fever, rash, joint pain, or red eyes within 2 weeks after traveling to a country where Zika virus cases have been reported. Be sure to tell your healthcare provider where you traveled.

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**Can a previous Zika virus infection cause someone who later becomes pregnant to have an infant with microcephaly?**

We do not know the risk to the baby if a woman is infected with Zika virus while she is pregnant. However, Zika virus infection **does not** pose a risk of birth defects for future pregnancies. [Zika virus usually remains in the blood of an infected person for about a week](#). The virus will not cause infections in a baby that is conceived after the virus is cleared from the blood

**If a woman who is not pregnant is bitten by a mosquito and infected with Zika virus, will her future pregnancies be at risk?**

No. If infected, Zika virus usually remains in the blood of an infected person for about a week. The virus will not cause infections in a baby that is conceived after the virus is cleared from the blood.

**Is it safe to get pregnant after traveling to a country with Zika virus?**

If infected, Zika virus usually remains in the blood of an infected person for about a week. The virus will not cause infections in a baby that is conceived after the virus is cleared from the blood.

**Can a pregnant woman be tested for Zika weeks or months after being in a country with Zika?**

[At this time, we do not recommend routine Zika virus testing in pregnant women who have traveled to a country with known transmission](#). First, there can be false-positive results due to antibodies that are made against other related viruses. Second, we do not know the risk to the fetus if the mother tests positive for Zika virus antibodies. We also do not know if the risk is different in mothers who do or do not have symptoms due to Zika virus infection.

**What is being done to investigate the association between Zika virus infection and birth defects?**

- In an effort to better understand what might be responsible for the rise in microcephaly cases, the Brazilian Ministry of Health (MOH) and the Pan American Health Organization (PAHO) are performing a thorough investigation.
- CDC has been invited by PAHO to provide technical assistance to the Brazil MOH for its investigation of microcephaly and the possible association with Zika virus infection by collaborating on studies.
- CDC has been regularly communicating with representatives from PAHO and the Brazil MOH to discuss the investigation and laboratory testing options.
- CDC has offered to test samples from the microcephaly cases for serologic evidence of Zika virus infection until in-country capacity can be established.
- CDC will continue to provide guidance to people considering travel to places where Zika is present.

**I am pregnant. How will Zika virus affect me or my unborn baby?**

CDC has issued a [travel notice \(Level 2-Practice Enhanced Precautions\)](#) for people traveling to regions and certain countries where Zika virus transmission is ongoing.

This travel notice follows reports in Brazil of [microcephaly](#) and other poor pregnancy outcomes in babies of mothers who were infected with Zika virus while pregnant. However, additional studies are needed to further characterize this relationship. More studies are planned to learn more about the risks of Zika virus infection during pregnancy.

Until more is known, CDC recommends special precautions for pregnant women and women trying to become pregnant:

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- Pregnant women in any trimester should consider postponing travel to the areas where Zika virus transmission is ongoing. Pregnant women who do travel to one of these areas should talk to their doctor or other healthcare provider first and strictly follow [steps to avoid mosquito bites](#) during the trip.
- Women trying to become pregnant should consult with their healthcare provider before traveling to these areas and strictly follow [steps to prevent mosquito bites during the trip](#).

Because specific areas where Zika virus transmission is ongoing are difficult to determine and likely to change over time, CDC will update this travel notice as information becomes available. Check [CDC's Zika Travel Information website](#) frequently for the most up-to-date recommendations.

### **What should a pregnant woman do if she has symptoms of Zika?**

If you are pregnant and develop a fever, rash, joint pain, or conjunctivitis (red eye) and have recently traveled to a country where Zika has been reported, contact your healthcare provider as soon as possible. Pregnant women who have a fever should take acetaminophen (Tylenol®) for fever control. Be sure to tell your healthcare provider where you have traveled. CDC is working to develop guidelines for appropriate screening of pregnant women with Zika virus infection as well as appropriate guidelines for the evaluation of the newborn.

### **Does every woman who has Zika virus get symptoms?**

About one in five people infected with Zika will develop symptoms, and we don't know that there is a different risk of symptoms for pregnant women. Symptoms typically begin 2 to 7 days after being bitten by an infected mosquito. For people who get sick, the illness is usually mild.

### **Can a blood test or ultrasound detect birth defects? How early or late in pregnancy?**

CDC's National Center on Birth Defects and Developmental Disabilities (NCBDDD) has an existing webpage that provides information on the diagnosis of birth defects both during pregnancy and after birth: <http://www.cdc.gov/ncbddd/birthdefects/diagnosis.html>. Some tests need to be done during a particular time in pregnancy, but others such as an ultrasound can be done at many points in pregnancy.

The reports from Brazil indicate a marked increase in reported microcephaly following the time of year with high levels of Zika virus transmission. During pregnancy, microcephaly can sometimes be diagnosed during an ultrasound (which creates pictures of the body). However, microcephaly might not be able to be diagnosed until late in the second or early in the third trimester of pregnancy. CDC is working to develop guidelines for appropriate screening of pregnant women with Zika virus infection as well as appropriate guidelines for the evaluation of the newborn.

### **How accurate are the tests?**

The accuracy of the test varies depending on the type of test, the timing of the test during pregnancy, the specific equipment used for the test, and the person conducting the test.

Microcephaly can develop at different points in time during pregnancy; therefore, the ability to detect microcephaly on a prenatal test is also dependent on the test being conducted after the condition has occurred.

### **Can babies with microcephaly live a normal life or life span? What are the chances?**

Babies with microcephaly can have a range of other problems, depending on the severity of their microcephaly. Microcephaly has been linked with the following problems:

- Seizures

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- Developmental delay, such as problems with speech or other developmental milestones (like sitting, standing, and walking)
- Intellectual disability (decreased ability to learn and function in daily life)
- Problems with movement and balance
- Feeding problems, such as difficulty swallowing
- Hearing loss
- Vision problems

These problems can range from mild to severe and are often lifelong. In some cases, these problems can be life-threatening. Because it is difficult to predict at birth what problems a baby will have from microcephaly, babies with microcephaly often need close follow-up through regular check-ups with a healthcare provider to monitor their growth and development.

#### **Who could advise a woman who is pregnant and concerned about Zika?**

Women should consult with their healthcare providers (in most cases her obstetrician, but in some cases family physicians or certified nurse midwives) about any concerns regarding Zika infection and the potential effects on the unborn baby.

CDC has developed [interim guidelines for pregnant women](#) during a Zika virus outbreak and is working to develop appropriate guidelines for the evaluation of the newborn to help inform conversations between providers and their patients.

#### **What advice is CDC providing to obstetric providers?**

The American College of Obstetricians and Gynecologists' web site has issued information on its website directed to obstetric providers and the general public. They have linked that information to CDC information regarding [Zika virus in South America](#).

CDC has released interim guidelines for [pregnant women](#) during a Zika virus outbreak and is working to develop appropriate guidelines for the evaluation of the newborn. Because there are limited data and experience with Zika virus in pregnancy, CDC continually evaluates any new or emerging data that may inform future recommendations. As more information becomes available, we will update the [CDC Zika website](#).

You can find additional Q&As about Zika virus and for healthcare providers here: <http://www.cdc.gov/zika/hc-providers/index.html>.

#### **Is there guidance for fetal screening? How early and how often?**

CDC has developed [interim guidelines for pregnant women](#) during a Zika virus outbreak and is working to develop appropriate guidelines for the evaluation of the newborn.

#### **Is ultrasound safe in pregnancy?**

Ultrasound is performed during pregnancy when medical information is needed. It has been used during pregnancy for many years and has not been associated with adverse maternal, fetal, or neonatal outcomes. Ultrasound operators are trained to use the lowest power for the minimum duration of time to obtain the needed information. There is consensus among various national and international medical organizations (American College of Radiology, American College of Obstetricians and Gynecologists, and the Society of Maternal and Fetal Medicine) that ultrasound is safe for the fetus when used appropriately.

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## LABORATORY

### **What biosafety precautions should a lab take when working with Zika virus?**

Labs should take BSL2 precautions for Zika virus.

## INFORMATION FOR OBSTETRICAL HEALTHCARE PROVIDERS

### **What types of testing for Zika virus are available to test pregnant women?**

During the first week of illness, Zika virus disease can often be diagnosed by performing reverse transcriptase-polymerase chain reaction (RT-PCR) on serum. Serological assays can also be used to detect Zika virus-specific IgM and neutralizing antibodies, which typically develop toward the end of the first week of illness. Plaque-reduction neutralization testing (PRNT) can be performed to measure virus-specific neutralizing antibodies to confirm primary flavivirus infections and differentiate from other viral illnesses

### **How can I order a Zika virus test for a patient that has traveled to an area with Zika virus transmission?**

There are no commercially available tests for Zika virus. Zika virus testing is performed at the CDC Arbovirus Diagnostic Laboratory and a few state health departments. Healthcare providers should contact their state and local health department to facilitate testing. See the [Diagnostic Testing](#) webpage for information on how to obtain Zika testing.

### **How is maternal Zika virus infection diagnosed?**

Laboratory evidence of maternal Zika virus infection can include Zika virus RNA detected by RT-PCR in any clinical specimen; or positive Zika virus IgM with confirmatory neutralizing antibody titers that are  $\geq 4$ -fold higher than dengue virus neutralizing antibody titers in serum. Testing would be considered inconclusive if Zika virus neutralizing antibody titers are  $< 4$ -fold higher than dengue virus neutralizing antibody titers.

### **What are the challenges in interpreting Zika virus testing?**

RT-PCR test may not demonstrate Zika virus RNA in a woman with Zika virus infection if the period of viremia has passed. Serum serologic testing can be performed, however, cross-reactivity with related flaviviruses (e.g., dengue and yellow fever viruses) is common. Plaque-reduction neutralization testing (PRNT) can be performed to measure virus-specific neutralizing antibodies to Zika virus, but neutralizing antibodies may still yield cross-reactive results in persons who were previously infected with another flavivirus, such as dengue, or has been vaccinated against yellow fever or Japanese encephalitis. It is important to work closely with your state or local health department to ensure the appropriate test is ordered and interpreted correctly.

### **How can Zika virus infection be prevented?**

There is no vaccine to prevent Zika virus infection. Travelers can protect themselves by taking steps to prevent mosquito bites. Use insect repellent; wear long-sleeved shirts and long pants; and stay in places with air conditioning or with window and door screens. Pregnant women can and should choose an EPA-registered insect repellents and use it according to the product label. See <http://wwwnc.cdc.gov/travel/page/avoid-bug-bites>.

### **What is known about the effects of Zika virus on pregnant women?**

We expect that the course of Zika virus disease is similar to that in the general population. No evidence exists to suggest that pregnant women are more susceptible or experience more severe disease during pregnancy. It is not known if pregnant women are more susceptible to Guillain-Barré syndrome.

### **Is there any association between Zika virus infection and congenital microcephaly?**



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There have been reports of congenital microcephaly in babies of mothers who were infected with Zika virus while pregnant. Zika virus infections have been confirmed in several infants with microcephaly; it is not known how many of the microcephaly cases are associated with Zika virus infection. Studies are under way to investigate the association of Zika virus infection and microcephaly, including the role of other contributory factors (e.g., prior or concurrent infection with other organisms, nutrition, and environment).

**Is there any known association between maternal Zika virus infection and other adverse pregnancy outcomes?**

The full spectrum outcomes that might be associated with Zika virus infections during pregnancy is unknown and requires further investigation.

**How should pregnant patients who are considering travel to an area with Zika virus transmission be counselled?**

Until more is known, CDC recommends special precautions for pregnant women, pregnant women in any trimester should consider postponing travel to an area where Zika virus transmission is ongoing. If a pregnant woman is considering travel to one of these areas, she should talk to her healthcare provider. If she travels, she should strictly follow steps to avoid mosquito bites during the trip.

**How should women trying to become pregnant who are considering travel to an area with Zika virus transmission be counseled?**

They should consult with their healthcare provider before traveling to these areas and strictly follow steps to [prevent mosquito bites](#) during the trip.

**Which pregnant women should be tested for Zika virus infection?**

[Obstetrical providers](#) should obtain a travel history from all pregnant women and use recent travel history to guide decisions about testing. Testing is not indicated for pregnant women without a travel history to an area with Zika virus transmission.

Pregnant women with a history of travel to an area with Zika virus transmission and who report two or more symptoms consistent with Zika virus disease (including acute onset of fever, maculopapular rash, arthralgia or conjunctivitis) during or within two weeks of travel should be tested. In addition, pregnant women with a history of travel to an area with Zika virus transmission and who have ultrasound findings of fetal microcephaly or intracranial calcifications should also be tested for Zika virus infection. Testing should be performed in consultation with state or local health departments.

**Why is Zika virus testing not recommended for all pregnant women who have travelled to an area with Zika virus transmission?**

As with all tests, healthcare providers must carefully weigh the risks and benefits of testing. CDC would not recommend testing for asymptomatic pregnant women with a travel history unless there is fetal ultrasound finding of microcephaly or intracranial calcifications. Serologic testing results are difficult to interpret. False positives due to cross-reactivity may lead to undue concern and clinical management based on inaccurate information (i.e. false positives or inconclusive tests). [Interim guidelines for screening, testing, and management of returning pregnant travelers will be updated as more information becomes available.](#)

You can find additional Q&A about Zika virus and pregnancy here:  
<http://www.cdc.gov/zika/pregnancy/question-answers.html>.



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We'll continue to post additional information for healthcare providers as it becomes available here: <http://www.cdc.gov/zika/hc-providers/index.html>. Our current page also includes a series of Q&A for obstetrical healthcare providers: <http://www.cdc.gov/zika/pdfs/questions-answers-clinicians.pdf>

### **What specimens can be tested for Zika virus?**

Zika virus RT-PCR and serology assays can be performed on maternal serum or plasma. Zika virus RT-PCR can also be performed on amniotic fluid. Other testing that can be performed includes the following: 1) histopathologic examination and immunohistochemical staining of the placenta and umbilical cord, 2) Zika virus testing of frozen placental tissue and cord tissue, and 3) IgM and neutralizing antibody testing of cord blood.

### **Why is fetal ultrasound recommended?**

Fetal ultrasound is generally performed in pregnancies between 18-20 weeks of gestation to assess fetal anatomy as part of routine obstetrical care. Microcephaly and intracranial calcifications can be detected during routine ultrasounds, as well as during ultrasounds performed later in pregnancy. Microcephaly and intracranial abnormalities have been demonstrated in pregnancies with known Zika virus disease. Abnormal ultrasound findings in women with recent travel to an area with Zika virus transmission can provide an opportunity to identify findings consistent with fetal Zika virus infection and offer pregnant women the option of amniocentesis to test for Zika virus RNA.

### **What ultrasound findings would be expected in association with a fetal Zika virus infection?**

The full spectrum outcomes that might be associated with Zika virus infections during pregnancy is not known. Congenital microcephaly and intracranial calcifications have been detected on ultrasound as early as 18-20 weeks

### **When should a screening fetal ultrasound be performed?**

If a pregnant woman has symptoms consistent with Zika virus disease during or within 2 weeks of travel, she should be seen by her healthcare provider. If a pregnant woman does not experience clinical symptoms consistent with Zika virus disease during or within 2 weeks of travel, ultrasound evaluation is recommended. Serial ultrasound screening (every 3-4 weeks) may be considered at the discretion of the provider. The optimal time to perform ultrasound screening for fetal microcephaly and other neurologic abnormalities is not known.

### **Who should be offered amniocentesis?**

Amniocentesis should be offered to pregnant women with recent travel to an area with Zika virus transmission and a positive or inconclusive maternal serum test. For pregnant women with recent travel to an area with Zika virus transmission and ultrasound findings of microcephaly or intracranial calcifications, amniocentesis may also be considered. Consultation with a maternal-fetal medicine specialist should be considered.

### **Why is amniocentesis offered?**

While amniocentesis is a relatively safe test, risk and benefits of amniocentesis should always be considered. An amniocentesis can be used to provide additional clinical information. For example, a positive RT-PCR result on amniotic fluid would be suggestive of intrauterine infection and potentially useful to pregnant women and their healthcare providers to guide decisions about timing of delivery and the level of neonatal care at delivery sites.

### **When should amniocentesis be performed?**

Timing of amniocentesis should be individualized based on the patient's clinical circumstances. Amniocentesis is not recommended until after 15 weeks of gestation. Amniocentesis performed  $\geq 15$  weeks of gestation is associated with lower rates of complications than those performed at earlier gestational ages, and early

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amniocentesis ( $\leq 14$  weeks of gestation). However, the exact timing of amniocentesis should be individualized based on the patient's clinical circumstances. Referral to maternal-fetal medicine or infectious disease specialist with expertise in pregnancy management may be warranted. Risk and benefits of performing the amniocentesis should be discussed with the patient.

**How would results of Zika virus RT-PCR amniotic fluid test results inform clinical management of pregnant women?**

A positive Zika virus RT-PCR result from amniotic fluid would be suggestive of intrauterine infection. This information would be useful for pregnant women and their healthcare providers to assist in determining clinical management (e.g., antepartum testing, delivery planning). A negative Zika virus RT-PCR result from amniotic fluid may prompt a work up for other causes of microcephaly (e.g., other infections, genetic disorders).

**How should pregnant patients who are considering travel to an area with Zika virus transmission be counseled?**

Until more is known, and out of an abundance of caution, CDC recommends special precautions for pregnant women. Pregnant women in any trimester should consider postponing travel to an area where Zika virus transmission is ongoing. If a pregnant woman is considering travel to one of these areas, she should talk to her healthcare provider. If she travels, she should strictly follow steps to avoid mosquito bites during the trip.

## INFORMATION FOR PEDIATRIC HEALTHCARE PROVIDERS

**What is the link between Zika virus in Brazil and the high numbers of infants born there with microcephaly?**

Zika virus infections have been confirmed in several infants with microcephaly from Brazil. The time frame and geographic location of reports of infants with microcephaly coincides with the outbreak of Zika virus infections in Brazil. The baseline prevalence of congenital microcephaly is difficult to determine because of underreporting, and the inconsistency of clinical criteria used to define microcephaly. Although population-based estimates of congenital microcephaly in Brazil vary, the number of infants with microcephaly currently being reported in Brazil is greater than would be expected.

**What birth defects have been reported in infants with confirmed Zika virus infection?**

Brain abnormalities reported in infants with microcephaly and laboratory-confirmed congenital Zika infection include microcephaly and disrupted brain growth. Some infants with possible Zika virus infection have been found to have intracranial calcifications and abnormal eye findings. It is not known if Zika virus infection caused any of these abnormalities.

**What birth defects have been reported in infants with suspected Zika virus infection?**

A report of 35 infants with microcephaly who were born during an outbreak of Zika virus infection in Brazil in 2015 described the following brain abnormalities: intracranial calcifications, ventriculomegaly, and neuronal migration disorders (lissencephaly and pachygyria). Other anomalies included congenital contractures and clubfoot. An important distinction is that neither these infants nor their mothers had laboratory-confirmed Zika virus; however, most of the mothers (~75%) reported symptoms consistent with Zika virus.

(<http://www.cdc.gov/mmwr/volumes/65/wr/mm6503e2er.htm>)

**How is microcephaly diagnosed after birth?**

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Microcephaly is diagnosed when an infant's head is smaller than expected as compared to infants of the same age (or gestational age) and sex. Although a universally accepted definition of microcephaly does not exist, microcephaly is most often defined as head circumference (occipitofrontal circumference) greater than 2 standard deviations below the mean, or less than the 3<sup>rd</sup> percentile based on standard growth charts (e.g., Fenton, Olsen, CDC, or WHO growth curves).

([http://www.who.int/childgrowth/publications/technical\\_report\\_pub/en/](http://www.who.int/childgrowth/publications/technical_report_pub/en/))

### **What are the potential sequelae of microcephaly?**

For infants diagnosed with microcephaly, head size correlates with underlying brain size. However, these measurements do not consistently predict long term sequelae. Neurologic sequelae may include seizures, vision or hearing problems, and developmental disabilities. Symptoms vary with the extent of brain disruption.

Additional information about microcephaly is available at:

<http://www.cdc.gov/ncbddd/birthdefects/microcephaly.html>.

### **What causes congenital microcephaly?**

Causes of congenital microcephaly may include genetic conditions such as chromosomal abnormalities or maternal exposures (e.g., alcohol, mercury, or radiation) during pregnancy. Maternal infections that have been associated with microcephaly include cytomegalovirus (CMV), herpes simplex virus, rubella virus, lymphocytic choriomeningitis virus (LCMV), *Treponema pallidum* (i.e., syphilis), and *Toxoplasma gondii*.

### **What treatment exists for infants with congenital Zika virus infection?**

No treatment is currently available for Zika virus infection. Care for these infants is focused on diagnosing and managing conditions that are present, monitoring the child's development over time, and addressing problems as they arise.

### **What is the prognosis for a newborn with congenital Zika virus infection?**

The prognosis for infants with congenital Zika virus infection is not known. In infants with severe microcephaly from other causes, a range of neurologic sequelae have been reported (e.g., intellectual disability, hearing loss, vision loss, and seizures). These problems can range from mild to severe, are often life-long, and in some cases can be life-threatening.

### **Which newborns should be tested for Zika virus infection?**

Testing for Zika virus infection is recommended for infants born to women who traveled to or resided in an area with ongoing Zika virus transmission during pregnancy who were 1) diagnosed with microcephaly or intracranial calcifications detected prenatally or at birth, or 2) who have mothers with positive or inconclusive test results for Zika virus infection.

### **How are infants diagnosed with Zika virus infection?**

Zika virus infection can be diagnosed by performing reverse transcriptase-polymerase chain reaction (RT-PCR) on infant serum. Serology assays can also be used to detect Zika virus-specific IgM and neutralizing antibodies. However, since it has not been established which test is most reliable for a diagnosis in infants, RT-PCR and IgM tests should both be performed. Plaque-reduction neutralization testing (PRNT) can also be performed to measure virus-specific neutralizing antibodies and differentiate from other flaviviruses.

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**If Zika virus testing of a newborn is indicated, how is the test ordered?**

There are no commercially available tests for Zika virus. Zika virus testing is performed at the CDC Arbovirus Diagnostic Laboratory and at some state and territorial health departments. Healthcare providers should contact their state and local health department to facilitate testing. See the Diagnostic Testing webpage for information on how to obtain Zika testing (<http://www.cdc.gov/zika/hc-providers/diagnostic.html>).

**If Zika virus testing of a newborn is indicated, what specimens are recommended?**

Zika virus RT-PCR and serology assays can be performed on infant serum or serum or plasma collected from the umbilical cord. If cerebrospinal fluid (CSF) specimens are available, Zika virus RT-PCR should be performed; however, CSF specimens should not be collected for the sole purpose of Zika virus testing. Other specimens that can be tested include the placenta and the umbilical cord. Histopathologic examination and immunohistochemical staining can be performed. Zika virus RT-PCR on fixed and frozen tissue should also be considered.

**When is a newborn considered to have congenital Zika virus infection?**

A newborn is considered to be congenitally infected if 1) Zika virus RNA is detected in any newborn specimen or during testing of amniotic fluid or the placenta, or 2) Zika virus IgM antibodies are detected along with confirmatory neutralizing antibody tiers that are  $\geq 4$ -fold higher than dengue virus neutralizing antibody titers in the infant serum or cerebrospinal fluid (CSF). Testing for congenital infection is considered inconclusive if Zika virus IgM antibodies are detected but Zika virus neutralizing antibody titers are  $< 4$ -fold higher than dengue virus neutralizing antibody titers.

**What are the challenges in interpreting Zika virus testing in a newborn?**

Zika virus testing in newborns has several challenges. RT-PCR tests may not detect Zika virus RNA in a newborn who had Zika virus infection *in utero* if the period of viremia has passed. Serologic tests for Zika virus can often be falsely positive because of cross-reacting antibodies against related flaviviruses (e.g., dengue and yellow fever viruses). Plaque-reduction neutralization testing (PRNT) can be performed to measure virus-specific neutralizing antibodies to Zika virus, but neutralizing antibodies may still yield cross-reactive results in newborns due to maternal antibodies that were transferred to the infant. It is important to work closely with state or territorial health departments to ensure the appropriate test is ordered and interpreted correctly.

**Should healthcare providers report infants with positive or inconclusive Zika virus test results?**

Health care providers should report positive or inconclusive results to their state or territorial health department. As an arboviral disease, Zika virus disease is a nationally notifiable condition.

**What should healthcare providers do to evaluate infants with positive or inconclusive Zika virus test results?**

A thorough physical examination should be performed, including careful measurement of the head circumference, length, weight, and assessment of gestational age. Cranial ultrasound is recommended unless it was performed as part of prenatal screening in the third trimester and clearly showed no abnormalities of the brain. Ophthalmologic evaluation is recommended as well as repeat hearing screen at six months of age. Continued evaluation of developmental characteristics and milestones, including head circumference, is recommended through the first year of life.

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**What additional evaluation is recommended for infants with positive or inconclusive Zika virus test results who have microcephaly or intracranial calcifications?**

Consultations are recommended with a clinical geneticist or dysmorphologist, a pediatric neurologist, and a pediatric infectious disease specialist. A complete blood count, platelet count, and liver function tests should also be conducted. If any additional congenital anomalies are identified through clinical examination and imaging studies, genetic and other teratogenic causes should be considered.

**What should healthcare providers do for an infant with negative test results for Zika virus infection?**

For infant without suspected abnormalities, healthcare providers should continue with routine pediatric care. If the infant has microcephaly or intracranial calcifications, healthcare providers should continue to evaluate and treat for other possible etiologies.

**If a mother had Zika virus infection during pregnancy but the newborn tests negative for Zika virus, what is recommended for additional follow-up?**

If the newborn does not have abnormal findings on examination, the infant should receive routine pediatric care including measurement of growth and development, and appropriate evaluation and follow-up for any clinical findings that arise. If the newborn has abnormal findings on examination, diagnostic testing for other causes of the newborn's conditions should be performed including testing for other congenital viral infections if indicated.

**If a mother had Zika virus infection during pregnancy, should she breastfeed her infant?**

Although Zika virus RNA has been detected in breast milk, transmission of Zika infection through breastfeeding has not been documented. Based on available evidence, the benefits of breastfeeding infants outweigh any theoretical risk related to Zika virus infection.